

NH Climate Change Action Plan Mitigation and Adaptation Options Descriptions

Cross-Sector Issues (CSI)

1.1. Coordination with the 25 x '25 Plan

The Climate Change Action Plan could be aligned with the Governor's 25 x '25 Plan that is currently in development.

1.2. Northeast Low Carbon Fuel Standard

The state could take part in California Low Carbon Fuel Standards which would affect all sectors and focus on the lifecycle emissions associated with fuel sources.

1.3. Economy-Wide Input-Based Carbon Systems Benefit Charge

A fee could be assessed across all economic sectors that is based on the carbon content of fuels.

1.4. Climate Change Action Plan Administrative Entity

The state could create an administrative entity to oversee the development and implementation of the New Hampshire Climate Change Action Plan selected by the Governor's Task Force by coordinating the efforts by the various state agencies and conducting regular evaluations to ensure that the Plan is achieving benchmarks and targets.

1.5. Comprehensive Education and Outreach Program

The state could develop an integrated and comprehensive education and outreach program that is designed to achieve reductions through bottom up (consumer, tenant) and top down (builders, designers) forces.

1.6. Greenhouse Gas Inventorying and Registry Reporting Assistance

The state could develop the capacity necessary to provide businesses, industrial facilities and electrical generators with the resources and training needed to inventory and report the annual GHG emissions to a state or national GHG registry.

Electrical Generation and Usage (EGU)

EGU-1 Emission Control

1.1. Pass and Implement the Regional Greenhouse Gas Initiative (RGGI)

The Regional Greenhouse Gas Initiative, or RGGI, is a cooperative effort by Northeastern and Mid-Atlantic states to reduce carbon dioxide emissions from electric power generators. This initiative is a multi-state cap-and-trade program with a market-based emissions trading system. House Bill 1434 was introduced and assigned to the NH House Science, Technology and Energy Committee. If HB 1434 were enacted, then rulemaking would follow and the program would begin on January 1, 2009.

1.2. Expand the Regional Greenhouse Gas Initiative

Based on a review of the program in 2012, RGGI could be expanded to include industrial sources and smaller generation facilities while further reducing the cap in regional CO₂ emissions beginning on January 1, 2019.

1.3. An Output-Based CO₂ Systems Benefit Charge

An out-put based charge is a charge on energy production that is based on a lbs/CO₂ per hour charge. This could incentivize generation efficiency programs and carbon capture and sequestration. The money generated by the tax could be earmarked for energy efficiency and conservation programming, renewables or research.

1.4. Mandate Capture and Storage of CO₂ from Existing Energy Sources

As an alternative to RGGI, the state could require the separation, capture, transportation and long-term storage of CO₂ from fossil fuel-fired plants. This process is ideally suited for coal given its high carbon content, abundance and low associated electricity costs.

1.5. Incentives for a CO₂ Pipeline to Enable Carbon Capture and Storage (CCS)

The development and implementation of carbon capture technology on a wide-scale from electrical generation will need to be paralleled with a transportation system to get the gas to locations where it can be stored. A pipeline that connects the CO₂ sources to a central collection facility may be required.

1.6. Implement an Output-Based New Source Performance Standard

In addition to RGGI, an output-based emission standard (emission limit) for CO₂ could be developed that is applied to all NH new fossil fuel-fired plants. The emission standard could be set at the lowest feasible limit using advanced technology. Under this policy, new coal plants may be limited to an emission rate of 200 lbs/mWh, depending on the feasibility of employing integrated coal gasification combined cycle (IGCC) technology capable of carbon capture for sequestration on the order of a 90% reduction in emissions.

1.7. Implement an Output-Based Performance Standard for Older Plants

As an alternative to RGGI, an output-based emission standard (emission limit) for CO₂ could be developed that is applied to all of New Hampshire's older fossil fuel-fired plants. The emission standard could be set at the lowest feasible limit using advanced technology. This policy could be developed so that generators can meet the standard by purchasing emission credits including renewable energy generation or sequestration projects.

EGU-2 Renewable and Non-Emitting Generation

2.1. Implement Existing Renewable Portfolio Standard (RPS)

The state passed an RPS in spring 2007 that mandates that 23.8% of the retail sales to instate customers will be met by renewable energy sources by 2025. The first benchmark is 4% in 2009, with incremental increases from that point.

2.2. Develop and Implement an Expanded Renewable Portfolio Standard (RPS)

Several states, including Connecticut, have amended their RPS to include a class that recognizes energy efficiency as a form of renewables. This has incentivized the development of Combined Heat and Power resources, as well as load management strategies. The increased efficiency could occur during generation, transmission and distribution, as well as through load reduction.

In order for this program to work most effectively, the energy efficiency component can not take credit for the existing System Benefits Charge program; this new class of renewables would complement existing energy efficiency programs.

2.3. Research and Start-up of Emerging Technologies

The state could develop policies and programs that assist in the research and incubation of emerging technologies that would be most promising for the state and the region. These renewable technologies could drive both emission reduction and economic growth.

2.3.1. Assessment of Project Feasibility

Expansion of the state's renewable generation capacity could be improved through the evaluation of the geographic, financial and political feasibility of project placement and development. This information may enable the most likely areas to place renewable generation to be mapped. Consideration could be given to the cost implications of siting proximity to existing transmission infrastructure.

2.3.2. Promote Renewable Energy Research and Development

Each state has different environmental conditions that create obstacles and opportunities to deploying and operating renewable energy systems. New Hampshire could work with the University System of New Hampshire, as well as provide incentives to businesses, to research and develop renewable energy technologies that are best suited to the state. Funds from the RPS Alternative Compliance Payment (ACP) could be used for this purpose.

2.3.3. Consumer Clean Energy Option

In order to increase the market for renewable power, create a mechanism for state residents to voluntarily purchase 50% or 100% renewable energy for their homes and businesses. The utility company would contract with either a renewable energy or a REC provider to meet the demand above the percentage of renewables required by the RPS. The consumer would be assessed a per kWh fee so that their total added cost is proportionate to their total energy expenditure. For NH to see the emission reductions there may need to be a clause developed that mandates that the Clean Energy Option be met by instate renewable generation or energy efficiency.

2.3.4. Streamline Renewable Energy Siting

The state could review existing procedures for the approval of specific renewable energy projects (e.g. wind, biomass, fuel cells, CHP) to determine how the approval process may be streamlined to meet the demand for renewables by addressing barriers such as permitting and interconnection hurdles, and standby power rates.

2.3.5. Production Tax Credit

This tax credit rewards renewable energy production and is typically applied to the first years that qualifying renewable electric projects are in operation. The credit may be paid on a per kWh basis and can be applied to a number of tax types

2.3.6. Investment Tax Credit

The investment credit is designed to reduce the costs for the purchase, installation, or manufacture of renewable energy systems, equipment, and facilities. The tax rewards the development of renewable energy capacity and may best serve residential and commercial installations and be funded by a modified system benefits charge mechanism. The credit could be designed so that homeowners and developers can take the rebate/credit. In the case of the developer, this could increase the number of homes built on spec with renewables in mind, lowering cost and improving integration. The tax credits can be applied to a number of tax types.

2.3.7. Payback Buy-Down

For commercial, municipal and industrial applications, the state could develop a mechanism to increase the adoption of renewable energy technology. To do so it can cover the first costs associated with new renewable energy systems in comparison with conventional energy systems. Restrictions could be put in place to ensure right-sizing of the systems and therefore contain costs.

2.3.8. Promote Novel Emerging Finance Mechanisms

The state could promote the development of innovative funding mechanisms for renewable energy projects. There is potential to develop investment funds that provide financial support for the development of projects. The return on these investments could be generated partly through electric sales to the grid as well as through revenues from the sales of Renewable Energy Credits (RECs).

2.4. Nuclear Power Plant Capacity and Licensing

There may be potential to initiate construction at the former location of the second reactor site at Seabrook station. Although controversial, once constructed nuclear is clean power with essentially no emissions and reduces demand on use of fossil fuels.

EGU-3 Demand Response

3.1. Remove Barriers to Clean Distributed Generation

Diesel engines have long been used as distributed power sources to provide emergency back-up power to industry and emergency services. But even new units have GHG emissions that are significantly higher than power plants that burn cleaner fuels or have emission controls. Although there are state regulations (i.e., NH Code of Administrative Rules Chapter Env-A 3700 NOx Emissions Reduction Fund for NOx-Emitting Generation Sources¹) that encourage installation of emission controls on diesel engines, these controls do not address GHG emissions. The use of alternative technologies need to be encouraged as a method for meeting demand for distributed power and can include combined heat and power (CHP), microwind and fuel cells.

3.2. Third Party Demand Response Techniques

The removal of any regulatory barriers that prohibit an increase in third-party load management that enable utilities to manage commercial loads during peak load events or in response to emergency

¹ Administrative Rules can be found at the NH Department of Environmental Services Website, see <http://www.des.state.nh.us/>.

shortages. There may be regulatory barriers that prevent the mass penetration of real-time electric information and load-management services, related to the installation of metering, control and communication systems, from penetrating the mass commercial markets. The design of third party response programs could mitigate the potential for distributed energy production to rely on diesel generators.

3.3. Pricing Mechanisms

Pricing mechanisms could be employed to encourage energy conservation and efficiency during peak load events when the extra capacity may be drawn from the dirtiest sources.

These mechanisms may also result in the use of distributed capacity, a process which may actually increase emissions depending on the generation's emission factor. In this event, the pricing mechanisms could be paired with a program to push for renewable or low emission energy sources through incentives (e.g. loans, grants, rebates, tax credits) to guide the development of the increased distributed capacity.

3.3.1. Time of Use Metering

Time of Usage (TOU) metering involves dividing the day, month and year into tariff slots, with higher tariff rates at peak load periods and lower tariff rates at off-peak load periods. While this can be used to automatically control usage on the part of the customer (resulting in automatic load control), it is often simply the customers responsibility to control his own usage, or pay accordingly (voluntary load control). This also allows the [utilities](#) to plan their transmission infrastructure appropriately.

3.3.2. Real-Time Pricing (RTP)

A pricing mechanism whereby electricity prices change to reflect the current supply-demand situation and the utility's cost of generating and/or purchasing electricity. The resulting price signal is intended to provide end users with an incentive to reduce their electricity demand through curtailed activity.

3.3.3. Smart Metering

The use of "smart meters" could be paired with RTP and would allow utilities to communicate with rate payers in order to alert them to changes in rate and therefore adjust their usage accordingly. These advanced meters also allow the utilities to identify what time of day the electricity was consumed.

3.4. Preferential Energy Efficiency Purchasing

The state could mandate that utilities purchase energy efficiency resources first in the Forward Capacity Market (FCM) as a demand response mechanism rather than purchase electricity from expanded generation capacity.

EGU-4 Energy Efficiency

4.1. Energy Efficiency as a Priority Resource

Establish energy efficiency as a priority resource for the energy resource (capacity) planning process in order to integrate energy efficiency into utility and state resource planning activities. Provide for frequent updates to plans to accommodate new information and technology.

4.2. Regional Energy Efficiency Initiative

An interstate cooperative energy efficiency effort may be necessary to reduce NH electrical generation emissions below a certain point and pace due the fact that NH is part of a regional grid and is a net exporter electricity. In 2005, state electricity exports represented approximately 54% of the state's total generation up from 34% in 2002. NH's electrical emissions are significantly driven by external forces and therefore internal policies will be insufficient to address this large jump since 1990.

4.3. Energy Efficiency Utility

The state could establish a third party that is charged with administering energy efficiency services throughout the state. These services could include technical assistance and financial incentives to households and businesses to help them reduce their energy costs through the purchase of energy-efficient equipment and the adoption of energy-efficient construction and renovation techniques. See Efficiency Vermont.

4.4. Rate Decoupling

Historically, distribution companies established an electricity sales forecast that included both fixed and variable costs of electricity production, and set rates in accordance with that forecast. Once these rates were determined, the distribution companies' revenue is directly dependent on the amount of kilowatt hours sold – creating a “throughput incentive.” Under this paradigm, a reduction in kilowatt hours sales due to the success of efficiency programs can be harmful to a distribution company's financial performance. To remove this disincentive to energy efficiency, one solution is to “decouple” utility sales from revenue and factor in the impact due to efficiency in rate design.

4.5. Market Transformation and Technology Development Programs

Market transformation is a process whereby energy efficiency innovations are introduced into the marketplace and over time penetrate a large portion of the eligible market. In the past few years, many program planners and policy makers have begun discussing program and policy initiatives to encourage and accelerate the market transformation process. Instead of saving energy building-by-building, a market transformation approach seeks to change the entire market for particular products or services so that efficient products or services are the norm and do not need to be promoted with incentives. A market transformation strategy can be built from a combination of different program and policy initiatives ranging from R&D to utility incentives and voluntary commitments to building codes or equipment efficiency standards.

4.6. Funding

Energy efficiency programs and market transformation may require funding in order to cover the education and outreach to raise awareness as well as the first or total costs associated with energy efficiency appliances and products. This funding can arise from a variety of sources that is both direct and indirect.

4.6.1. RGGI Energy Efficiency Fund

Funding that arises from the allowance auction that can be shifted towards energy efficiency projects that lower demand and make long-term RGGI targets easier to attain.

4.6.2. Increase System Benefits Charge (SBC) Funding

This action will build on the success of the existing SBC funded efficiency programs through different mechanisms. Explore actions that will build on the success of the existing SBC funded efficiency programs by either expanding the fund or expanding the projects that qualify for funds. This action would double the rate charge that is assessed for efficiency only, without any increase in the energy assistance funding. While SBC funding would double, there would only be a 40% increase in each ratepayer SBC related costs.

4.6.3. Modify SBC Funding program

This action would change the types of projects that the SBC charge will fund. The current fund is limited to energy efficiency projects only, but the SBC could potentially fund clean distributed energy projects if any existing siting procedures that hinder the process were streamlined. The funds could also be used to leverage the investment in renewable energy projects.

4.6.4. Energy Efficiency Investment Tax Credit

The state could create tax credits to promote energy efficiency in the commercial and industrial sectors. Tax credits that are provided for the investment in energy efficiency projects would go to the commercial and industrial sector that pay into the business profit tax.

4.7. LED Traffic Signals

Grants could be given to municipalities to cover a portion of the cost to replace incandescent traffic lights with more efficient light emitting diode traffic lights.

4.8. Thermal Load Reduction

A program could be established to expand the adoption of the technology and practices that reduces the thermal load imposed on buildings by the surrounding environment (e.g. ambient air temperature; insulation).

4.8.1. Urban Tree Planting Program

The state could have a program to reduce building energy consumption through the use of properly planted trees throughout cities and downtowns. When correctly sited, trees in urban areas can decrease energy use by reducing wind speed in winter and by shading buildings and lowering air temperatures in summer. Improperly planted trees in urban environments can actually increase energy use by shading buildings in winter and adding humidity in summer. Tree effects on wind in summer may or may not be beneficial, depending on air temperature. The key factors that affect the ability of a tree to provide direct shading of a building include placement relative to buildings and seasonal solar angle; type; species foliage characteristics; height; and crown form, spread, and density.

4.8.2. Suburban Tree Planting Program

The state could have a program to reduce building energy consumption through the use of properly planted trees around residences. When correctly sited, trees in suburban areas can decrease energy use by reducing wind speed in winter and by shading buildings and lowering air temperatures in summer. Improperly planted trees in can actually increase energy use by shading buildings in winter and adding humidity in summer. Tree effects on wind in summer may or may not be beneficial, depending on air temperature. The key factors that affect the ability of a tree to provide direct shading of a building include placement relative to buildings and seasonal solar angle; type; species foliage characteristics; height; and crown form, spread, and density.

4.8.3. Green Roofs and White Roofs

The state could have a program that promotes the installation of highly reflective and emissive roofing materials or Green Roofs to reduce building cooling load. This program would target mainly large flat or low-sloped commercial and industrial roofs.

4.9. Appliances

Appliance and equipment efficiency standards reduce energy use, save consumers and businesses money, and cut power plant pollution that harms public health and the environment. The state could support a variety of programs that could lead to more rapid market transformation of appliances used

within residences and institutions and businesses. The new generation of appliances would be characterized by a substantial reduction in operating costs by being significantly more energy efficient.

4.9.1. State-level Appliance Efficiency Standards

This action could enable New Hampshire business and residential consumers to lower energy consumption by speeding up the availability and use of energy efficient products. The mechanism for accomplishing this goal is the establishment of minimum energy efficiency standards for eight categories of new products that include heating, lighting, refrigeration and consumer electronics. The New Hampshire Public Utilities Commission (NH PUC) will administer the standards. Standards apply to new products only; the program would not contain any requirements for the replacement of existing products already in use.

4.9.2. Federal-level Appliance Efficiency Standards

As federal regulations regarding appliances may trump state and local regulations, the state could support the adoption of more stringent appliance standards at the federal level.

4.9.3. Old Appliance Retirement

Given the above standards as a starting point, New Hampshire could, in conjunction with other energy efficiency programs and through direct public service announcements, promote the replacement of older equipment and appliances with those meeting higher energy efficiency ratings. Possibly develop a “pay-as-you save” program, possibly under the Electrical SBC or the potential Revolving Loan Program to replace old appliances in the residential sector with new Energy Star appliances.

4.9.4. Institutional Bulk Purchase Programs

To help defray the first costs associated with any energy efficient appliances by residents, municipalities or institutions, the state could develop a bulk purchase mechanism that reduces prices charged to the consumer by aggregating the buying power.

4.9.5. Consumer Education Program

The state could develop or expand an outreach and education program designed to raise awareness and promote the purchase of energy efficient products and the available energy efficiency services.

EGU-5 Transmission and Distribution

5.1. Increase Transmission and Distribution Efficiency

The state could establish a requirement that utilities utilize the best available technology to reduce energy loss during the transmission and distribution of electricity.

5.2. Transmission Constraints

The state could identify and address limitations in the existing capacity of transmission lines and other obstacles that would otherwise limit the siting, transmission and sales of renewable energy from the areas where its generation would otherwise be most viable.

5.2.1. Electrical Lines

Identify and address any limitations in the physical status of the New Hampshire and New England grid that restricts the deployment of combined heat and power and renewable generation facilities throughout the state.

5.2.2. Natural Gas

Identify and address any limitations in the current natural gas distribution system within the state that restricts the use of this cleaner burning, lower carbon fuel in residences, businesses and industrial facilities.

5.3. NH Energy Market Structure

5.3.1. Complete Deregulation or Decide Final Structure

In order to enable utilities to better plan for the future in terms of identifying resources and capacity to develop the New Hampshire energy market, deregulation may need to be completed so that the utilities will be able to better model their future needs and the impact of other CCAP programs and policies.

5.3.2. Interconnection Standards

In order to maintain the reliability of the grid and the safety of utility workers, the interconnection standards and process may need to be revisited to streamline the process for residences, businesses and industrial facilities that wish to generate their own power and tie into the grid, and yet do so in a manner that will not threaten the integrity of the system.

5.3.3. Net-Metering Standards

The state may need to revisit its net metering policy. Net metering is an electricity policy for consumers who own generally small, renewable energy facilities, such as wind or solar power, or use vehicle-to-grid systems. Under net metering, system owners receive retail credit for at least a portion of the electricity they generate. The ideal has the existing electricity meter spinning backwards, effectively banking excess electricity production for future credit. Net Metering is generally a consumer-based renewable energy incentive. However, in some case throughout the US over-burdened energy agencies are not providing incentives on a consistent basis and it is difficult for individuals to negotiate with large institutions to recover their Net Metering credits and/or rebates for using renewable energy.

Transportation and Land-Use (TLU)

TLU-1 Vehicle Design

1.1. Tailpipe Greenhouse Gas Standards

New Hampshire could consider the adoption of the California Air Resources Board (ARB) approved motor vehicle GHG standards. Under these standards, new motor vehicles will be required to emit 30 percent fewer GHGs than would have been emitted without the program. The program establishes two fleet average standards for GHG emissions: one for cars, light trucks, and small sport utility vehicles (SUVs) and another for heavier trucks and large SUVs. The standards will be phased in between the years 2009 and 2016. In 2009, the standards will require a small reduction in GHGs and will ramp up to a 30 percent reduction requirement for new vehicles in 2016. These standards will provide substantial GHG reductions, as well as reductions of non-methane organic gas (NMOG), nitrogen oxides (NOx), and carbon monoxide (CO), relative to the federal motor vehicle emission control program.

1.2. Improved Corporate Average Fuel Economy (CAFE) Standards

New Hampshire could pursue improvements to federal CAFE standards for passenger cars and light-duty trucks (which includes sport utility vehicles, SUVs) with progressive increases in mpg in each year's fleet of new sales. With this initiative, New Hampshire could work with other states, its Congressional delegation, environmental groups, and others to pursue improvements to encourage the US Congress to enact more stringent national corporate average fuel efficiency (CAFE) standards for automobiles. If this were achieved it could reduce the level, influence the design, or diminish the need for NH-specific fuel-efficiency incentives or standards.

1.3. Clean Diesel/Black Carbon Reduction

Scientists have identified black carbon, a component of the particulate matter (PM, or soot) released by diesel fuel combustion, as having a large and fast-acting warming impact on the atmosphere. Although, the impact of black carbon is not captured in current estimates and future projects of state GHG emissions, the state may want to consider a program that targets the emissions from heavy duty diesel engines through a clean diesel program and emission control technology.

1.4. The SmartWay[®] Program Implementation

The SmartWay[®] Transport Partnership is an innovative collaboration between the U.S. EPA and the freight industry to increase energy efficiency while significantly reducing greenhouse gases and air pollution.

1.5. Add-On Vehicle Technology

The state could promote the use of add-on technologies that reduce the friction associated with vehicle operation and decrease the energy consumption per trip. This includes the use of low rolling resistance tires and low friction engine oil.

1.6. Advanced Technology Vehicles and Infrastructure

The state could consider developing the infrastructure and policies necessary to speed the introduction of alternative vehicles into the state fleet. This could include the resources required for plug-in and fuel cell vehicles.

1.6.1. High Fuel Economy Hybrid Promotion

New Hampshire could promote the purchase and use of hybrid vehicles within the state's fleet, business fleets, and by private citizens. Hybrid vehicles combine a gasoline engine and electric motor to power the vehicle. A sophisticated on-board computer regulates the operation of each to

balance a more efficient operation of the vehicle (i.e., high miles per gallon). Unlike electric vehicles, hybrid vehicles never need an outside source of electricity because recharging of the battery pack is accomplished using the operation of the gasoline engine and recapturing energy normally lost through braking (known as regenerative braking). The range of hybrid vehicles is essentially unlimited because they use only gasoline as a fuel, which is readily available anywhere.

1.6.2. Fuel Cell and Infrastructure Development

The state could identify the obstacles that would prevent the adoption of fuel cell cars by state and business fleets and by private citizens and take the steps to initiate the deployment of the infrastructure required to leverage greater market penetration.

1.6.3. Plug-in and Infrastructure Development

The state could identify the obstacles that would prevent the adoption of plug in electric vehicles or hybrids by state and business fleets and by private citizens and take the steps to initiate the deployment of the infrastructure required to leverage greater market penetration.

TLU-2 Low Greenhouse Gas/Black Carbon Power Sources

The state could pursue transformation of fleet that emphasizes fuels with lower net greenhouse gas and black carbon emissions.

2.1. Electric

New Hampshire could continue to pursue funding for, and purchase of, electric vehicles, and continue to promote their use in appropriate applications as well as the infrastructure necessary for their expansion.

2.2. Biodiesel

The state could mandate a B5 standard across the board that requires 5% biodiesel by volume in all road fuel sold in the state to start. This requirement could be elevated to B20 when the ASTM blend is right. An education and outreach program may be necessary, targeting potentially state inspection stations, so that drivers make any necessary changes to fuel lines and filters as well as engine seals.

2.3. Ethanol

The state could mandate that a certain percentage of the fuel sold in the New Hampshire comes from ethanol that has a specific level of lifecycle GHG emissions associated with “well to wheels.”

2.4. Natural Gas

As part of the Alternative Fuels Vehicle Project (funded by CMAQ monies), New Hampshire installed a natural gas refueling station and subsidized the purchase of several natural gas powered vehicles for the state’s fleet. New Hampshire could continue to promote the use of natural gas vehicles in the state’s fleet and in the private sector, and promote the establishment of refueling facilities.

2.5. Propane

As an addition to the Alternative Fuels Vehicle Project, the state could promote the use of promote vehicles in the state's fleet and in the private sector, and promote the establishment of commercial refueling facilities.

2.6. Hydrogen

The state could explore the potential to deploy hydrogen fueled cars in the state. These cars would rely on combustion rather than fuel cells to power the vehicles.

TLU-3 Fuel Efficiency

Regulations may be able to reduce the emissions from vehicles substantially, but consumer and driving behavior will also play a role in market transformation and total fleet emissions. Identifying specific leverage points may enable mechanisms to be developed which speed the integration of lower carbon cars and driving styles into society.

3.1. Market-Based Mechanisms

The state can develop market-based policies and programs that encourage consumers to purchase cars with a lower carbon footprint.

3.1.1. Revenue Neutral Feebate

This initiative would create a fee and rebate ("feebate") incentive system that is a refinement of taxes paid for the purchase of new cars and light trucks. State residents purchasing low efficiency (low fuel economy) vehicles would pay a higher fee and those purchasing high efficiency vehicles would get a rebate. This could be designed to be revenue neutral, thus keeping the overall revenues the same as before. The feebate would need to be adjusted annually to ensure stability of revenues, and updated periodically to (1) monitor impacts and adjust the incentive system to meet or change the goals, (2) take account of technology changes, and (3) take account of national or regional initiatives.

3.1.2. CO₂-Based Registration Fee

A similar policy to the feebate, but this would allow a car that uses lower carbon fuels to be charged a lower fee than a conventional fuel vehicle that gets the same fuel economy.

3.1.3. "Clunker" Retirement Program

A strategy to reduce emissions by getting older, lower mileage vehicles off the road. Incentives for motorists to retire old vehicles could include payment for registered vehicles to be retired, rebates for purchasing a new car meeting certain criteria (i.e., minimum fuel economy, maximum emission standards), and rebates for energy efficient appliances. Funding for incentives could be provided through registration surcharges for vehicles with poor fuel economy and/or emission standards (which could also provide another incentive for consumers to purchase higher mileage, lower emitting vehicles), federal transportation grants, and safety/emissions inspection surcharges.

3.1.4. Green Car Labeling

The Granite State Clean Cars Program, which began in 2002, is a partnership between the New Hampshire Automobile Dealers Association (NHADA), Breathe NH, the Appalachian Mountain Club (AMC), and the New Hampshire Departments of Environmental Services and Transportation (DES and DOT). The goal of the partnership is to inform the public about cleaner, more fuel efficient vehicles and make it easier for consumers to identify these vehicles at dealerships in New Hampshire.

3.1.5. Preferential Parking or Travel Lanes for Low Emission Vehicles

The state could require that parking areas designate preferential parking to vehicles that have a higher fuel economy or lower CO₂ emission rate. This could be expanded to include preferential parking for high occupancy vehicles, which reduce CO₂ emissions but through a fundamentally different means.

3.1.6. Tax Relief for Advanced Technology/High Efficiency Vehicles

This action reviews and considers modifying the Business Energy Tax Credit and the Residential Energy Tax Credit programs to ensure that they are effectively promoting the purchase of more fuel-efficient vehicles. An incentive could be based on the fuel efficiency (miles per gallon) or emission rate (lbs CO₂/mile) of the vehicle rather than a specific technology.

3.1.7. Green Fleet Incentive Program

Work with fleet operators to provide the information, training and incentives necessary for the adoption of a clean fleet policy that is appropriate for:

- **Municipal Fleets**
- **Commercial Fleets**

3.2. Vehicle Operation

The state can identify the driving behaviors that lead to greater GHG emissions, and develop the policies and programs to reduce the occurrence of those behaviors.

3.2.1. Speed Limit Reduction

Vehicle emissions rates are directly related to vehicle speed and additionally are highest during the acceleration mode and lowest during the idling mode. Maximum efficiency is achieved at speeds between 30 and 55 mph. Above 55 mph, fuel efficiency can decline approximately one percent for each mile exceeding 55 mph. Consequently, lowering travel speeds from 70 to 55 mph can reduce fuel consumption up to 23 percent, depending on the age of the vehicle. The optimal driving speed within cities is estimated at 35 mph, and 55-60 mph for highway conditions. Reducing the average speed of traffic may be accomplished by several means as well as increased road safety.

3.2.1.1. Speed Limit Enforcement

The state could explore the deployment of greater police presence to reduce the average speed of traffic through greater visibility as well as through an increased number of citations.

3.2.1.2. Lower Speed Limit

The state could lower the speed limit on specific road types in a manner that is expected to result in the most efficient traffic speeds and flow patterns.

3.2.2. Truck Stop Electrification

Overnight idling associated with long-haul trucking is estimated to up to five percent of annual heavy truck fuel consumption and costs to drivers each year. Drivers typically let their vehicles idle to heat or cool sleeper cabs, maintain the battery charge while using electrical appliances and to keep engines warm in cooler climates. Truck stop electrification (TSE) provides an alternative to idling for commercial vehicles. Installed at truck stops or rest areas, TSE technology provides a power source that allows the driver to operate all on-board systems while parked. TSE systems require the use of either standalone systems owned and operated by the truck stop (or a third party vendor), which require a modification to the vehicle to be used in conjunction with electric outlets installed at each parking space.

3.2.3. Improved Traffic Flow

The state could investigate the best means to increase traffic flow in and around towns in order to reduce congestion and wasted fuel.

3.2.3.1. Targeted Congestion Management and Air Quality (CMAQ) Funds

The state may be able to use CMAQ funding to complete road improvement projects that improve traffic patterns.

3.2.3.2. Traffic Light Timing

The state could initiate a project to ensure that the optimal timing exists at traffic lights in order to minimize the idling time for the majority of vehicles and improve fuel economy.

3.2.4. Locomotive Anti-Idling Policy and Program

Work with the federal government to establish regulations and incentives concerning the length of time that locomotives are allowed to remain idling in train yards and other areas.

3.2.5. Vehicle Maintenance Training

The condition of a vehicle can affect how it handles and its fuel economy. The state could explore the development of vehicle maintenance education programs that supports better maintenance by fleet managers and individual owners.

3.2.6. Enforce and Expand Anti-Idling Programs and Regulation

The state of NH already has an existing regulation (Env-A 1101.05) that governs diesels and may need to be reviewed to determine compliance as well as the potential to expand the program to other vehicle types.

TLU-4 Vehicle Miles Traveled (VMT) Reduction

4.1. Vehicle Miles Traveled (VMT) Reduction Programs

Vehicle design will facilitate GHG emissions reductions at one level, but NH's VMTs are increasing due to a variety of factors and so transportation sector emissions could continue to grow as well even as vehicles become more efficient. Developing policies and programs that encourage decreased VMTs will be essential to controlling the Transportation sector emissions.

4.1.1. Modify Gas Tax

A program to reduce VMT by increasing the per-mile cost of driving in a way that can foster conservation and efficiency. It is estimated that an increase in the price of fuel of 10 percent over time will reduce VMT by over three percent and improve fuel efficiency by six percent, resulting in an overall reduction in fuel consumption of nine percent.

Further reductions in local and regional VMT can occur through the reallocation of gas tax revenues to fund investments in alternatives to single occupancy vehicle use. Increases in the gas tax can serve as a dedicated revenue stream for local transit systems that can fund service improvements and infrastructure investments. The combination of increasing fuel prices while simultaneously improving alternative transportation modes can result in increased ridership levels for transit and a reduced number of vehicles on the road.

4.1.2. Commuting Efficiency Program

This program would focus on increasing the number of passengers per trip. Reducing single occupancy vehicles would reduce total vehicle miles traveled and, thus greenhouse gas emissions from mobile sources of transportation. This program would build upon existing programs in the

state such as car and van pools, preferred parking, and park-and-ride lots. It would provide fare reductions (subsidies/vouchers) for transit use in commuting and Ride-Home programs for commuters who use alternative modes.

4.1.2.1. Park and Rides

The state could identify the Park and Ride facilities that need to be expanded as well as the optimal locations for the development of new sites as well as a recognizable “brand” that increases the recognition by commuters. Co-location of park-n-rides with other services and/or residential development can further reduce VMT.

4.1.2.2. Commuting Incentives

The state could work with businesses and insurance companies to offer incentives to employees that carpool to work. This could include reduced rates; a stipend to cover the costs of rideshares and vanpools; prioritized parking; and parking cash-out payments.

4.1.2.3. Congestion Pricing

NH could use congestion pricing to encourage commuting by charging drivers a fee that varies with the level of traffic on a congested roadway. Attention could be paid to reduce the impact of this action on those whose livelihood requires using the road and may not be able to avoid certain roads or travel times (e.g. trucking).

4.1.2.4. High Occupancy Vehicle (HOV) Lanes

The expanded use of travel lanes that are designated for vehicles with a specific number of passengers in order to incentivized carpooling and reduce the number of vehicles on the road and the total vehicle miles traveled.

4.1.3. Commuting Trip Reduction Initiative

This program would focus on decreasing the number of trips per day. This initiative could reduce vehicle use by providing incentives for flex time, telecommuting, telecommunications and internet commerce. Telecommuting involves home-based work, or working from a nearby telecommute center to decrease commute travel. This option is enhanced by advancements in electronic communications (i.e., internet, email, voicemail). Similarly, compressed work schedules (such as working four ten-hour days a week versus five eight-hour days) can eliminate some commuter travel. Proximate commuting involves employee job swapping of relatively interchangeable positions at companies with multiple branches (e.g., retail clerks, chain restaurant staff) in order to shorten the commute distance of employees.

4.1.3.1. Promote Telecommuting

Employers could be encouraged to allow appropriate employees to work from home (typically once a week) in order to reduce vehicle trips. By using measurable tasks and constant communication to ensure accountability there is a reduction in VMTs that is often associated with an increase in productivity and job satisfaction.

4.1.3.2. Flexible Schedules

Employers could be encouraged to offer compressed work schedules in which employees would work the same number of hours over fewer days. A typical 40-hour week can eliminate a day of driving if worked in 4 10-hour shifts. Some employees also work 9-hour days over two weeks, with one day off every other week.

4.1.4. Vehicle Miles Traveled (VMT)-Based Insurance Premium Structure

This program would reward those who drive less. This insurance mechanism would base all or some portion of annual insurance premiums on vehicle miles traveled (VMT) and would be an odometer-based fee (e.g., at the time of annual registration). The program would provide incentives to make more efficient travel decisions and location choices (i.e., purchase a home closer to work) and thus reduce VMT's, energy use and emissions of GHGs and pollutants. This approach may raise equity issues with low-income and rural drivers and many insurers remain resistant to the administrative changes that would be required to implement VMT-based insurance, but the concept is beginning to take hold in other areas.

4.1.5. Location Efficient Mortgages (LEM)

The state can explore the potential to expand the availability of Location Efficient Mortgages that are designed to maximize accessibility and overall affordability. Typical properties that qualify are close to good transit service and public services, have good walking and bicycling conditions and other features that reduce automobile dependency. Per-household transportation expenditures also tend to be considerably lower for residents in such areas. The LEM typically combines a low down payment, competitive interest rates, and flexible criteria for financial qualification to encourage homeownership in these areas.

4.1.6. Pricing Measures to Reduce Vehicle Miles Traveled (VMT)

This program would create market-based parking charges or access fees for parking at offices, malls and apartment buildings. These charges can eliminate a large subsidy borne by non-drivers financially supporting the infrastructure (e.g., parking lots, plowing, etc.) necessary for the automobile. Cash-out parking provides employees with the option of receiving cash instead of driving to work and using employer-provided "free" parking. Experience with cash-out parking has proven that employers will save in parking costs by reduced demand.

TLU-5 Smart Growth

Land use patterns are changing in ways that increase vehicle miles traveled (VMT). As communities grow and physically spread out through low-density residential and commercial development and more people choose to live in rural areas further away from their jobs, vehicle miles traveled per household have increased. Additionally, how land is used has implications for the release of carbon that is sequestered in soils and the biomass of forests. Specific types of development can reduce VMT and preserve the integrity of undisturbed agriculture and forest lands within the state.

Smart Growth strategies are a collection of land use planning policies and techniques that promote more efficient land use, reduce land disturbance, and provide for compact, mixed-use, transit-supporting development, with the objective of creating more attractive, livable, economically strong communities while protecting natural resources. The goals for land use with respect to reducing the impact of continuing development on climate change are identical with the goals of the broader "smart growth" initiative, thus additional strategies may be identified by reviewing recent documents outlining the full complement of strategies to achieve smart growth (there are many such general documents as well as several NH reports containing more focused recommendations). A selection of the most applicable potential strategies available is included here.

5.1. General

5.1.1. Quantitative Goals for Future Land Use and VMT

Identify a set of measures using new and existing data to establish state and regional measures and goals for future patterns of growth and VMT (e.g., percentage of population living within a ½ mile of a Community Center Area, distribution of housing types, VMT per capita). Assist local municipalities in establishing similar measures and goals.

5.1.2. Management of Land Use Information

Improve statewide GIS (geographic information system) data and services through GRANIT (Geographically Referenced Analysis and Information Transfer). Provide for increased technical services and regular updates of data supporting better planning and assessment, including frequently updated land use cover data.

5.1.3. Integrated Land Use, Transportation and Emissions Planning

Promote and support integrated transportation/land use/environmental state, regional and local planning activities that evaluate the effect of alternative future development/transportation scenarios on VMT and energy use in identifying a preferred future land use/transportation vision. The state could develop tools that enable the connection between land use, transportation and GHG emissions to be better understood and made a major consideration of the state, regional, and local planning processes (e.g., within the integrated corridor planning process proposed by NH Department of Transportation's Long-Range Plan, as a component of the MPO regional transportation plans).

5.1.4. Encourage and Strengthen Regional Land Use Planning

Strengthen the role and financial support of regional planning agencies (RPAs) in addressing regional growth-related issues, such as transportation, development patterns, housing, and resource protection. Provide incentives for communities to work together and with the RPAs.

5.1.5. Smart Growth Planning, Modeling, and Tools

The development and availability of the resources required by local and regional planners to evaluate various options in order to determine the best means to restrict the GHG emissions associated with a project while providing the resources

5.1.6. "Fix-it-First"

Focus on maintaining existing resources and programs, emphasizing a "Fix it First" approach through which existing facilities and other infrastructure will be modernized and made efficient before new programs and installations are created. Emphasis on maintaining the infrastructure within established cities and town centers in particular would ensure that these existing developed areas can support increased population and development (e.g., not be limited by lack of available water/sewer capacity or hampered by traffic congestion due to failing intersections).

5.1.7. Infrastructure to Support Higher-Density Development

Provide financial and technical assistance for the provision of the necessary infrastructure to support higher-density development (e.g., creation of a new public water/wastewater treatment facility). Establish criteria to ensure that such funding does not contribute to worsening sprawl and increased VMT.

5.1.8. Funding Preference for Communities Adopting Appropriate Policies and Zoning

Give preference in awarding discretionary state-aid (water/sewer funds, transportation funds, block grants, etc) to areas that demonstrate consistency with "smart-growth" and/or reduced

energy impact development (e.g., to projects in or near existing community center areas and/or areas zoned for higher-density, mixed use with walkable design, to communities that “score” higher on consistency evaluation – e.g., MA discretionary funding depends (in part) on a community’s “score” regarding consistency with state policies/priorities (Massachusetts Commonwealth Capital Fund and scorecard)).

5.1.9.State School Funding

Other states, such as MA, have proposed that the state would cover the additional school costs resulting from increased housing development – “Smart Growth School Cost Reimbursement.” NH specific funding issues may need to be addressed to allow such a program. Such a program could provide an incentive to increased housing being allowed within and/or near to established community centers or within walking distances to schools (to further reduce VMT).

5.1.10. Two Rate Tax Structure

Explore altering the NH property tax structure by lowering the tax rate on building values and simultaneously raising the tax rate on land values to achieve revenue neutrality. Theoretically, taxing land values more heavily might promote more intensive development of land that is developed and, thereby, help to prevent socially excessive rates of land development.

5.1.11. Development Impact Fees

The state could create a policy that requires developers to pay for the portion of the infrastructure demands that their projects generate.

5.2. Transit/Alternative Transportation Infrastructure

5.2.1. Regional Intermodal Transportation System

Enhance existing intermodal transportation system, including intercity rail and bus service, NH and regional rail and airfreight, commuter rail, and all intermodal connections for passengers and freight. The option will decrease GHG emissions and the state and the region’s VMT by increasing the access (location), frequency, travel time, and quality of service for passenger rail and intercity bus service. The options will also decrease GHG emissions by providing adequate intermodal connections—including bike, pedestrian, transit, shuttle service, and parking facilities at all nodes—and increasing the use of rail for both in-state and regional freight movement.

5.2.2. Expand Transit Infrastructure

Develop policies, programs, and funding mechanisms to expand the existing transit infrastructure.

5.2.3. Transit-Oriented Development (TOD)

Foster the development of compact, walkable communities centered on an alternative transportation node/option (e.g., high-intensity, mixed use development surrounding a rail station). Assist communities in identify appropriate locations and development/design standards, and provide financial/technical assistance and/or other incentives.

5.2.4. Bike and Pedestrian Infrastructure

Build on existing bikeways and other efforts throughout the state to create more bicycle lanes and paths, eliminate hazards to cyclists and pedestrians, improve street network connectivity, as well as establish pedestrian malls and walkways, through grant programs, incentive systems, zoning and regulations.

5.2.5. Focus Transportation Enhancement Funding

Focus the use of Transportation Enhancement funds to increase walkability/pedestrian-orientation and/or support for alternative transportation options within more densely developed centers.

5.3. Land Use

5.3.1. Land Development Project Evaluation

Develop and make available resources, such as models, evaluation criteria, and/or standards for best practices, required by local and regional planners to evaluate and reduce the climate impact of development proposals (e.g., energy use, VMT-generated).

5.3.2. GHG/VMT Evaluation of Large Development Projects

Require assessment and implementation of design features to reduce GHG/VMT for large-scale projects subject to permit review by state agencies. What constitutes a “large-scale” project would need to be defined. Alternatively, could promote same through voluntary assessments and/or practices and/or incentive measures to encourage desirable behavior (e.g., financial, technical assistance, regulatory process, etc).

5.3.3. Educate and Assist Community Planning Officials

Provide additional training to planners and municipal planning and zoning board members on the connection between land-use, transportation and climate change as well as the tools that can reduce VMT and GHG emissions. Expand resources available to assist municipalities in integrated planning, identification of appropriate areas for higher-density development, and adoption of revised zoning and regulations to promote more efficient, and lower GHG-emitting, land use (e.g., Housing and Conservation Planning Program, the Regional Environmental Planning Program, I-93 Project Community Technical Assistance Program, NH Estuary Project Community Technical Assistance Program, or another grant/assistance program). Emphasize implementation of innovative land use zoning options, such as infill/mixed use, inclusionary/affordable housing, energy efficiency, open space/conservation design subdivisions, transfer of development.

5.3.4. Transfer of Development Rights

Establish an administrative entity to support the implementation of transfer of development programs within individual municipalities (e.g., to assess the economic value of development rights, to process and oversee transactions for compliance). Transfer of development programs refer to a method for protecting land by transferring the "rights to develop" from one area to another based on the market value of development. A community must reach consensus on the appropriate areas to target for conservation and where it is appropriate to permit increased development density.

5.3.5. Higher-Density Development Roadway Design and Management

Develop additional guidance and technical/financial assistance for municipalities wanting to make higher-density development more functional and appealing through such techniques as (a) access management and street connectivity planning along/within development corridors and areas to maintain traffic mobility; (b) design standards for walkability/pedestrian/bicycle comfort and aesthetics (scale, pedestrian-focus and amenities, landscaping/green spaces); (c) allowing flexibility in road standards to adapt to surrounding land uses.

5.3.6. Traditional Neighborhood/Pedestrian-Oriented Design

Develop additional guidance and technical/financial assistance for municipalities wanting to provide for more pedestrian-oriented design and/or traditional neighborhood design. Pedestrian-

oriented design and traditional neighborhood development integrate neighborhood and urban design principles to improve the pedestrian environment, making walking easier, safer and more attractive. The creation of more walkable developed environments requires both larger scale planning efforts (e.g., neighborhood layout, street layout), and urban design features that promote safety (e.g., cross-walk design) and aesthetics (e.g., pedestrian-scale and amenities).

5.3.7. Infill Development

Develop additional guidance and technical/financial assistance for municipalities to increase infill development (e.g., detailed model architectural standards, model form-based codes or framework). Infill development involves building and developing in vacant areas or increasing the intensity of development (e.g., building up) in community centers or higher-density settings. When done well, infill development can reduce VMT, reduce traffic congestion, save open space, and enhance the livability and vitality of the community.

5.3.8. Allow Accessory Dwelling Units

Encourage municipalities to permit accessory dwelling units to make efficient use of existing infrastructure, provide for alternative housing options, and increase the population density in urban and suburban areas.

5.3.9. Redevelopment

Promote use of RSA 79-E (Community Revitalization Tax Relief Incentive) by local municipalities (which allows for a tax reduction for significant rehabilitation of structures). Expand tax relief incentive with additional state-funded tax credit. Identify and remove barriers to redevelop/reuse/expanded use of historic structures (e.g., building codes).

5.3.10. Brownfield Redevelopment

Enhance funding and technical resources available for Brownfields redevelopment. Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties reduces development pressure on undeveloped, open land, and both improves and protects the environment.

5.3.11. Schools

The nature of schools as focal points in communities enables them to significantly impact the development of communities and VMTs.

5.3.11.1. Smart School Siting Standards

Review and revise state school siting standards to encourage retention of existing schools, or the construction of new schools, within established community centers to refocus development within existing urban/developed areas and reduce the trend towards sprawling suburban regions fueled by large schools at the urban edge. Reinvestment in existing local schools with pedestrian and bicycle access can result in greater accessibility for students and parents without the need for a motor vehicle.

5.3.11.2. “Safe Routes to School”

Promote additional “Safe Routes to School” programs. These efforts encourage parents and children to walk and bike to school through the provision of safer pedestrian environments. By creating more walkable and bikeable communities, these initiatives help achieve air quality targets while promoting local health benefits.

5.3.12. Reduced Parking Requirements

Promote lower parking requirements within local zoning to reduce parking supply. A decrease in the availability of parking spaces, together with the provision of alternative transportation options, can provide a disincentive to driving a vehicle and an incentive to take mass transit or other transportation mode to reach the desired destination. This may be especially effective if combined with preferential parking offered for high-occupancy vehicles.

Residential, Commercial and Industrial (RCI)

RCI-1 Heat and Hot Water

1.1. Thermal RPS

The state could develop a thermal RPS that mandates a certain percentage of the fuel required for heat and hot water production comes from renewable sources. These sources could be:

- Bio-Heating Oil
- Solar Hot Water Heating
- Passive Solar
- Biomass
- Combined Heat and Power

1.2. Building Energy Efficiency

1.2.1. Thermal System Benefit Charge (SBC)

An annual fund, based on a 3 percent surcharge on natural gas and home heating oil consumption that would provide approximately \$30 million for energy efficiency investment programs for equipment and buildings that utilize oil and natural gas. Project funding would be applied to both retrofit and first installation. Since the programs could operate in conjunction with electric efficiency programs, joint-fuel and fuel-blind initiatives could increase the ability to treat whole buildings regardless of fuel type.

1.2.2. Fuel Neutral Efficiency Program

The current NH “public benefits” energy efficiency investment programs are funded through electricity surcharges and do not fund programs that improve the energy efficiency of natural gas or oil consumption. It may be important that funds be available for whole projects so that integrated systems can be developed rather than update or install equipment that that draws from one particular energy source. A neutral agent may also be necessary to guide clients through the maze of technology, financing, implementation, commissioning, and operation.

1.2.2.1. Fuel Blind Revolving Loan Fund

A mechanism that covers the cost of energy efficiency projects for all energy sources. The loan is repaid from the savings incurred by the projects so that the consumer does not experience a change in energy costs until the loan is repaid.

1.2.2.2. Efficient Heat Retrofit

Convert electrically heated homes to oil or natural gas boilers and furnaces as well as ground source heat pumps.

1.2.2.3. Efficient Heating Installation

The funding could assist in covering the first costs associated with the initial installation of pre-qualified heat and hot water systems in new construction.

RCI-2 Building Design

2.1. Residential and Commercial Energy Codes

The specification and enforcement of building energy codes can impact the energy consumption of a buildings life including construction and operation.

2.1.1. Upgrade Building and Energy Codes

The state could create building and energy codes that affect all new construction and retrofits so that the buildings emissions are reduced throughout the remaining life of the building. These changes can occur via several mechanisms.

2.1.1.1. Adopt the Most Recent IECC

The state could require the automatic adoption of updated revisions of the Energy Code from the International Code Council (ICC) within 18 months as they become available for both residential and commercial buildings.

2.1.1.2. Performance-Based Code

The development of regulations that are written in terms of the desired energy efficiency that a building must meet rather than the process by which it must be constructed. The adoption of this approach opens up the possibility of new and innovative solutions to the construction process and increases the overall efficiency of the built space. The enforcement of the codes can become part of the building process (ex. charge a \$150 occupancy fee to pay for the blower tests that will indicate compliance with code) and would shift the responsibility to onto the builder rather than rely on code enforcement officers which may be absent or have multiple responsibilities. A “safety valve” could be written into the code such that when a builder applies for a test, if they do not receive it they are “presumed to pass”².

2.1.2. Increase Code Compliance

Anecdotal evidence suggests that there needs to be more inspectors as half of NH towns are without a code enforcement officer and in some municipalities they serve several roles and may not be able to ensure that all buildings meet code. The state could consider whether adding a state surcharge on all local building permit fees as well as the use of RGGI EE funds to support the program is feasible.

2.1.2.1. Improve Enforcement

The State Energy Office could create an Energy Code Enforcement Assistance Program to provide additional energy code enforcement and outreach officials to serve across the state.

2.1.2.2. Increase Training of Code Enforcement Officers

The increase in code enforcement officers would be complemented by increased education and training for existing officers and contractors.

2.2. “Time-of-Sale” Energy Requirement for Existing Buildings

The “Time-of-Sale” Energy Requirement will ensure that at the time of sale, existing buildings will be brought up to an improved efficiency level. The costs from the improvements can be borne by the seller (to improve the value of the building) or the buyer (to add as improvement costs in the mortgage).

2.3. High Performance Buildings

Building energy efficiency could also be targeted by developing programs that influence the design and construction of buildings through other top down and bottom up influences that could be created education and outreach.

² This addresses the fact that there may not be enough building auditors at present to meet the demands of such a code.

2.3.1. Incentives for High Performance/LEED Certified Buildings

The state could develop an incentive program that encourages developers and contractors to voluntarily erect buildings that meet more stringent energy efficiency requirements.

2.3.2. Training and Education for Builders and Contractors

The state could develop a training program for builders and contractors that educates them about the connection between buildings, energy use and climate change and the technologies and resources that they can utilize to limit their impact. Including a component related to marketing energy efficient and “climate friendly” buildings may be beneficial.

2.3.3. Climate Change Core Competencies in Professional License Programs

In the fields related to design and construction, the state could require climate change education as part of certification and licensing processes.

2.3.4. Outreach and Education Program to Real Estate Agents Association

To increase the demand for energy efficient and high performance buildings, outreach and education programs could be developed to provide real estate agents with the background they need to communicate the value of specific features to home buyers.

2.4. Building Materials

The GHG emissions associated with a building included those that result from the building materials embodied energy, which is the energy used to acquire, process and manufacture the materials as well as the energy used to transport the products to site and construct the building. Changing the nature of the materials used in construction, without compromising safety, may result in a significant reduction in GHG emissions.

2.4.1. Increased Use of Blended Cement

Compared to other products, cement, the binder in concrete has a high embodied energy. To reduce the embodied energy, Fly ash, a byproduct of coal burning plants can be substituted for a percentage of the cement. Also, pozzolan (volcanic ash) and magnesium oxide, which is mined or processed from seawater are other alternatives to cement.

2.4.2. Increased Use of Salvaged Materials in Construction (See AFW-4.1.4)

Rather than rely on virgin materials, the state could investigate the potential for salvaged building materials to be safely incorporated into new and renovated buildings and develop programs to encourage the development of deconstruction and salvage operations.

RCI-3 Energy Conservation

3.1. Commercial and Industrial Building Operator Training

Develop training programs to serve a larger number of building operators (including maintenance technicians, lead custodians, maintenance foremen, and plant engineers), who typically have little formal training in building efficiency. The training includes such topics as where to find and how to use building codes; how to read utility meters and bills; how to maximize heating, ventilation, and air conditioning controls; when to call for help; and how to improve a host of other operation and maintenance techniques.

3.2. Municipal Energy Management Program

A training program that provides the appropriate city and town employees with the information and resources that they need to reduce or manage the municipal energy consumption.

3.3. Residential Behavior Change Program

Develop a program that raises awareness concerning the mechanism, causes and solutions to climate change among the residential population and supports the adoption of energy efficient and conservation-based lifestyles among New Hampshire Residents.

3.3.1. Identify, Assist, and Leverage Community-Based Organizations

The state could develop a program that leverages the existing networks created by community organizations to disseminate a behavior change campaign that focuses on energy efficiency and conservation.

3.3.2. Energy Efficiency and Conservation in School Curriculum

The state could develop energy efficiency and conservation curriculum that is incorporated into existing learning frameworks in order promote a reduction in energy consumption in the present as well as prepare the next generation to use energy efficiently throughout their lives.

3.3.2.1. Develop Climate Change Solutions Curricula

Educators from around the state could be invited to share best practices, existing lessons plans and work with climate scientists and energy experts to develop age appropriate lesson plans that meet state standards. Emphasis could be placed on creating lessons that can be easily employed by educators in order to increase their utilization rate.

3.3.2.2. Integrate and Highlight School's "Best Practices"

Schools could develop an "implicit" curriculum that highlights the existing energy efficient and conservation practices within the school in order to connect the material in the explicit curriculum to real-life.

3.4. Remove Barriers to Renewable Energy and Energy Efficiency

Due to zoning restrictions, there may be barriers to deploying specific technologies that could reduce GHG emissions in the RCI sector. The state could evaluate the potential barrier that restrict residential, commercial and industrial usage of energy efficient and renewable energy technologies and develop policy and programs necessary to overcome them. These barriers may affect:

- Wind turbines
- Solar panels (PV and hot water)
- Clotheslines

RCI-4 Industry

4.1. Mandatory CO₂ Reporting

The state could establish a requirement for all industrial facilities to inventory and report their annual emission to a state registry.

4.2. Emission-Based Fees

To encourage innovation and adoption of energy efficiency and conservation in industrial processes, industrial facilities could be assessed a fee for each pound of CO₂ released into the atmosphere.

4.3. Expanded Regional Greenhouse Gas Initiative (RGGI)

RGGI could be expanded so that the cap in CO₂ emissions covers industrial sources as well.

4.4. Input-Based Carbon System Benefit Charge

Develop a tax on carbon emissions to drive greater energy efficiency. Use the funds from the tax to reinvest in energy efficiency either within the industrial sector or across all sectors.

4.5. Waste Energy Recycling

The state could establish a program to encourage the capture of thermal and kinetic energy that would otherwise be lost during industrial processes.

4.6. Process Gases Management

The state could establish a policy that requires that the synthetic GHG gases associated with industrial processes (SF₆, HFC, and PFC) be handled in a manner that reduces leaks and recovers waste gas to be recycled into the production process.

4.7. Use of Alternative Gases

The state could encourage or require the use of alternative gases in the production process that have the lowest possible global warming potential.

Agriculture, Forestry and Waste (AFW)

AFW-1 Carbon Sequestration

1.1. Research Forest Management and Sequestration

A program that would examine NH's public and private forests and determine how they could be best managed to maximize carbon sequestration and to develop potential markets for offsets from terrestrial carbon sinks. Land-based carbon sequestration typically involves conserving threatened forest; planting trees and restoring badly degraded agricultural or mineral extraction lands, where without intervention, forests would take decades to establish themselves; improving management of productive forestland; and promoting reduced impact agriculture. The goal would be to conduct research on NH's forest ecosystems and identify the management systems and standards for carbon "sink" offset projects that would maximize sequestration of carbon.

1.2. Build-Up Soil Carbon

Due to the potential for soils to sequester carbon and fertilizer applications to release nitrous oxide (N₂O), the cultivation practices on farms can impact the sequestration potential of the state's agricultural lands. Adopting specific practices can mitigate the impact of farming.

1.2.1. Increase Winter Cover Crops

Support greater adoption of cultivation practices that increase soil carbon content and increase the capacity of soil to hold nitrogen by cultivating winter cover crops. Increasing the use of cover crops can increase the soil carbon content and potentially increase the nitrogen content of soil and reduce fertilizer needed.

1.2.2. Reduce Summer Fallow

Support the adoption of agricultural practices that reduce the acreage that is left fallow (vegetation free) in order to maintain and possibly increase soil carbon content and reduce N₂O emissions.

1.2.3. Improve Water and Nutrient Use

Support the adoption of water and nutrient application procedures and rates that minimizes soil respiration (CO₂ release) and maximizes carbon retention.

1.2.4. Increased Organic Farming Practices

[0]Programs to increase acreage in organic cultivation relative to current expected growth, as organic farming techniques can build up soil carbon levels in farmed acreage.

1.2.5. Increased Conservation Tillage/No-Till Farming Practices

This program would encourage conservation tillage and related cropland soil management to improve per acre soil carbon storage rate. Practices that result in less disruption of the soil or increase organic content through carbon deposition can increase the carbon content (stock) of soil or reduce its rate of loss (flow) to the atmosphere. Reduced tillage is also less energy intensive and requires less fuel.

1.2.6. Convert Land to Grassland or Forest

Converting farmland to other types of land can lead to increased sequestration of carbon from the atmosphere.

1.3. Land Preservation

Preserving agricultural and forest lands preserves the soils ability to store carbon that would otherwise be released into the atmosphere if disturbed. The biomass on these lands is also able to absorb more carbon and further increase the amount of carbon that is sequestered. Disturbance releases the carbon stores and reduces or eliminates the capacity to absorb carbon dioxide.

1.3.1. Agriculture Land Preservation

A program to expand NH's efforts to acquire and preserve open space, reduce sprawl and encourage use of existing infrastructure to reduce. This program would seek to avoid releases of carbon stored in agricultural soils during development. Avoiding the conversion of this land to development, in conjunction with smart growth measures, preserves the carbon absorption capacity of existing agricultural lands and enables continued carbon sequestration from the atmosphere.

1.3.2. Forested Land Preservation

This program would expand NH's current efforts to acquire and preserve open space, reduce sprawl and encourage use of existing infrastructure. This program would seek to avoid releases of carbon due to conversion of forest to development. When forest land is converted, carbon is emitted when trees are cut and the soil releases sequestered carbon from the atmosphere is diminished.

1.4. Forest Management

Forests are capable of absorbing and storing carbon from the atmosphere. Managing forests can allow this capacity to be optimized and the eventual release of carbon following tree mortality to be used to displace fossil fuel emissions.

1.4.1. Stocking Thin Stands with Fast -Growing Trees

This program would convert poorly stocked stands to moderately stocked stands through the use of select faster-growing nursery stock in order to increase coverage in existing stands increases active carbon storage in both standing timber and forest soils.

1.4.2. Biomass Electricity Feedstock Promotion

This program would complement the previous forest management programs by creating incentives to make greater use forest products or forest waste as a fuel (in solid or gas form) or for co-firing with fossil fuels to reduce net CO₂ emissions from power generators if it replaces higher emissions supply sources.

1.4.3. Early Commercial Thinning

This program would encourage the early intentional thinning of timber producing lands in order to remove anticipated mortality and concentrate growth on the better remaining timber. This would increase carbon sequestration in the improved stock, with thinned trees used as a renewable energy source, or as building materials that displace higher emissions alternatives such as steel and concrete.

1.4.4. Greater Mortality Captured in Timber Harvest

This program would target the removal of dead or dying standing biomass with minimal impact on forest floor and soils in order to capture a significant percentage of the biomass that would otherwise be lost to natural mortality and decay on forest floors. By reducing the volume of decaying wood, the program will enhance carbon sequestration. This harvested stock can be used for energy generation, paper production, and building materials and displaces fossil-based energy use of conventional alternatives.

1.4.5. Active Softwood Increase

This program would convert forested lands currently classified as hardwood to softwood in order to increase soil sequestration. Softwood stands provide higher merchantable biomass use rates and can reduce greenhouse gas emissions by increasing biomass use rates for energy generation and building materials. Biomass removal can also reduce emissions from decay of dead and dying timber.

1.4.6. Increase Forestation on Under producing Lands

This program would convert marginal agriculture, pasture and unproductive brush lands back into healthy, productive forests (both riparian and upland) where possible. This program would be facilitated by the development of market mechanisms and accompanying carbon accounting mechanisms that enable the transfer of CO₂ emission offsets from non-federal forest landowners to emitting entities.

1.4.7. Durable Wood Product Promotion

This program would promote the use of durable wood products over other construction materials through a voluntary education campaign on climate change and what consumers can do to minimize their impacts. This program would encourage individual and business consumers to consider certified-sustainable wood products when buying furniture, building homes, and working on other structures. In addition, the state in its procurement process could lead by example and maximize its purchase of wood products. To ensure that increased use of timber results in a benefit to the environment, wood products could be produced and manufactured as a result of certified-sustainable harvesting practices.

AFW-2 Nutrient Management

Soil nutrient levels can affect both N₂O and CO₂ emission from soils. Managing nutrient sources and applications can impact the emissions associated with this sector.

2.1. Improved Nutrient Use

Support the adoption of improved nutrient application rates that balances crop needs with avoided N₂O emissions that result from excess usage. Using less fertilizer can reduce the related production, transportation, and application emissions.

2.2. Non-Farm Fertilizer Usage Reduction

This program would seek to reduce the amount of non-farm fertilizer use (e.g., residential and commercial). Part of the nitrogen spread on the soil is later emitted as N₂O (which has a global warming potential that is 310 times that of carbon dioxide); therefore, a reduction in the quantity of fertilizer applied can reduce N₂O emissions.

2.3. Manure Management

The state can develop programs and policies regarding the management and application of manure (as a fertilizer) to minimize the release of N₂O, as manure can have a high nitrogen content. This can include:

- Manure Composting
- Land-Application

2.4. Organic Farming

Utilizing organic farming techniques can reduce the on-farm energy uses (e.g., reduced tractor use) through reduced tillage and off-farm energy (e.g., transportation of fertilizer and pesticides).

2.5. Change Feedstocks

Support the cultivation of different agricultural feedstocks in order to optimize nitrogen uptake and maximize N₂O reduction.

AFW-3 Fuel and Electricity Generation

The AFW sector presents some opportunities for heat and electricity generation that can displace the combustion of fossil fuels as well as manage some issues associated with waste.

3.1. Waste-to-Energy

Investigate the potential to generate power by incinerating waste. Consideration needs to be given as to whether the combustion of trash would result in greater or less CO₂e emissions per unit of energy than the fossil fuel-fired power generation it displaces. The emission of other pollutants and toxics also needs to be considered.

3.1.1. Clean Municipal Biomass Waste

The state could encourage the development of resources necessary to collect and burn clean municipal biomass waste (e.g. brush, leaves) to generate energy possible in a CHP facility that provides electricity and district heating.

3.1.2. Biogas

Anaerobic biological processes in the waste (water and solid) management sector generates methane (CH₄), which has a global warming potential 25 times greater than CO₂. Managing the conditions and the resulting gas can reduce the potency of the AFW sectors emissions.

3.1.2.1. Centralized Manure Digesters

This program would support the installation of centralized anaerobic manure digesters to process agriculture manure into energy (e.g., heat, hot water, or electricity) and reduce GHG emissions from manure storage. In addition, it can generate electricity and offset GHG emissions produced by burning fossil fuels. The process would also produce digested manure, which can contain be used as a nitrogen-rich fertilizer for crop production.

3.1.2.2. Waste Treatment Plants

This program would support the development of onsite electricity and heat for wastewater treatment (WWT) through the combustion of methane produced during wastewater treatment. This process would reduce GHG emissions generated by WWT as well the generation of electricity required to power treatment facilities.

3.1.2.3. Landfill Gas

Landfills naturally create methane gas (CH₄, a GHG) as a by-product. Rather than being released into the air, methane can be captured and utilized as a fuel to produce energy or burned off (flared) thus vastly reducing its warming potential. Although, NH has seen a significant decrease in landfill gas emissions due to flaring and energy generation, the state may want to consider ensuring that this progress is maintained and expanded upon as possible.

3.1.2.3.1. Energy Project Development

This program would seek to increase the number of landfills in NH that reduce methane and generate electricity by: encouraging the generation of additional electricity from landfill gas-to-energy (LFGE) projects in the state through the NH renewable portfolio standard; working with the PUC and NHDES to streamline project permitting; and

supporting the interconnection of these projects by working with the PUC to ensure that even small projects are allowed to connect to the grid.

3.1.2.3.2. Landfill Gas Flaring

For all landfills too small to generate electricity other than for onsite use, the landfills could be required to flare their methane emissions.

3.2. Encourage Sustainable Biofuel Crop Production

The state could promote the development of renewable sources of biomass energy feedstocks in the state.

3.2.1. Forest Management - See AFW 1.4

3.2.2. Research Crops, Harvesting and Production Methods

This program would support the work that focuses on the identification of an oilseed crop that is appropriate for Biofuel production (possibly producing a high value meal product and a generous supply of low-value oil), as well as the methods to harvest the crop and produce the fuel.

3.2.3. Biodiesel Production

The state could develop programs and policies that promote the production of biodiesel in the state using NH grown feedstocks as inputs.

3.2.4. Develop Biofuel Demonstration Projects on Farms

Assist in the completion of a demonstration projects around the state that raise awareness about the potential for Biofuel crops to be grown and processed in state. Potential projects include growing the oil seed crops as a rotational crop, crushing and refining on-site, and producing all of the farm's fuel.

3.2.5. Identify and Promote Non-Forest Biomass Feedstocks

The state could encourage research and development of non-forest feedstocks for energy production in order to provide the state with rapidly growing renewable resources.

3.2.6. Expanded Use of Forest Biomass Feedstocks for Electricity (Fuel Switching)

In a move similar to the conversion of Schiller Station in Newington, the state could encourage the conversion of fossil fuel-fired plants to biomass facilities. Consideration may be given to ensure that harvest rates of the state's forest resources do not exceed sustainable harvest rates and lead to degraded landscapes.

3.2.7. Expanded Use of Forest Biomass Feedstocks for RCI Heating

The state could encourage the expansion of biomass as a fuel source for RCI furnaces, boilers and CHP systems.

AFW-4 Recycling and Source Reduction

A significant portion of the solid waste stream is composed of materials with a significant embodied energy and some materials have the potential to be recycled or reused and displace the emissions associated with producing new materials from virgin raw materials.

4.1. Increased Recycling and Source Reduction

This program would seek to increase source reduction and recycling of municipal solid waste (MSW) to a specified level above current rates and to maintain that level into the future. Potential implementation strategies include: increasing education and enforcement of recycling requirements;

increasing composting of source-separated organics (from commercial, industrial, and institutional generators and residential sources); increasing small business recycling; supporting recycling markets; increasing electronics recycling; increasing “producer responsibility” requirements for products.

4.1.1. Resource Management Contracting Initiative

This initiative would provide support for contractual arrangements between haulers and non-residential waste generators that cap compensation for garbage hauling and disposal and provide profit-sharing to contractors for waste minimization.

4.1.2. Pay-As-You-Throw Initiative (PAYT)

This initiative would provide education and incentives to communities to adopt Pay-As-You-Throw, which would in turn require households to pay for waste disposal based on the amount they generate through a fee that is assessed for each bag or can of waste or based on the weight of the trash, thereby providing an incentive for households to generate less waste. Any increase in recycling costs could be recovered from the fee for disposal.

4.1.3. Deposit Bottle Bill

A Bottle Bill would require a deposit at the time of purchase for certain bottles which is refunded upon return. Several states have deposit and redemption values that were established at 5 cents in the 70s. If this deposit is adjusted for inflation it is worth about 1.6 cents in today’s dollars, possibly contributing to a fall in containers returned for deposit. To counter this an effective deposit would likely be more effective if set at 10 cents.

4.1.4. Reusable Building Materials Salvage Incentives

Salvage of reusable building materials from buildings that are slated for demolition (often referred to as “deconstruction”) may recover furnishings and fixtures, wood flooring, molding and structural lumber, and other materials that can be reused, such as doors and sinks. This process can reduce construction and demolition debris and avoid the emissions associated with the production and transportation of virgin goods. In addition, “deconstruction” firms can provide jobs in state.

4.1.5. Statewide eWaste Recovery Infrastructure

Electronic waste (“e-waste”), such as computers, monitors, and televisions, is a rapidly growing waste stream in the U.S. Options for end-of-life management of e-waste include disposal, stockpiling, recycling, and reuse. For personal computers (PCs), both reuse and recycling reduces GHG emissions. Because of the large amounts of energy used to manufacture a PC (particularly fabrication of silicon wafers), reuse has much greater GHG benefits than recycling, as long as the reuse displaces or delays the production of a new computer.

4.1.6. Encourage Commercial Composting

Composting of food waste and other organics such as leaves and yard debris can significantly reduce net GHG emissions, both by reducing methane emissions from landfills and by sequestering carbon in agricultural soils treated with finished compost. The state may want to consider policies that encourage municipal compost programs and reduce barriers to commercial compost operation siting.

4.1.7. Ban Organics in Landfills

To reduce the bulk of methane emissions from landfills, the state could ban the organic materials that are anaerobically digested to release CH₄. These organics could be collected through

comprehensive paper recycling and compost programs that divert the organics into other useful waste streams.

AFW-5 Regional, State and Local Food Supply

Transportation is responsible for a significant portion of the GHG emissions associated with the food supply. The development of a stronger local food network can reduce the emissions associated with food and may also insulate the state from disruptions in the food supply in the event that energy supply is threatened.

5.1. Improve Opportunities for New Farmers

The state could develop policies and programs that assist new farmers looking to get established and could include training programs, loan assistance and farm incubation projects.

5.2. Strengthen Local Food Network

This program would seek to increase the amount of food consumed by NH residents from locally grown sources. Food processing, packaging, transportation, and marketing consume the vast majority of the energy used in the commercial food industry. Food transported from the larger food producing centers can travel more than 20 times the distance of locally grown produce.

Government Leadership and Action (GLA)

GLA-1 Building Efficiency and Conservation

The state could expand its efforts to achieve a 10% reduction in energy consumption in all state buildings.

1.1. State Shared Energy Savings Program

The state could establish a program that provides incentives to agencies that achieve savings through energy conservation. The program could allow any state agency to retain a portion of its energy savings accumulated during a fiscal year and these funds could be used for future energy costs or energy conservation related activities, with preference given to efficiency and conservation. A limit could be imposed such that the savings would only accrue to the agency for a period equal to the useful life of the conservation measures taken. To accomplish this the state may need to reconsider repealing RSA 21-I:19-d and e, which requires that savings from energy efficiency revert to the General Fund. These funds could instead be pooled and used to reinvest in further energy efficiency programming in state buildings.

1.2. Energy Star Purchase Policy

The state could establish a policy that requires the purchase (or lease) of all electronic appliances for use in state buildings to be Energy Star certified or better.

1.3. Building Automation Systems

The state could expand the usage of Building Automation Systems (BAS) to optimize the usage of HVAC equipment it owns and leases. BAS greatly increases the interaction of mechanical subsystems within a building, improve occupant comfort and lower energy use.

1.4. Climate Savers Computing Initiative

The state can join the Climate Savers Computing Initiative, lead by the National Governor's Association (NGA). The initiative is a nonprofit organization dedicated to promoting smart technologies that can improve the power efficiency and reduce the energy consumption of computers.

1.5. Building Design

The state could require that new construction and major renovations of all building projects that receive some state funding (state facilities, local schools, etc.) must exceed code.

1.5.1. State Defined High Performance Public Building Standards

The state could create a set of criteria, which exceeds the energy codes set for all private construction, that all new construction and renovations must meet.

1.5.2. LEED Rating for New Buildings

The state could mandate that new construction and renovation projects must meet LEED standards and certify with the U.S. Green Buildings Council (USGBC). The state may also need to provide education and outreach to towns, the NH Department of Education, and others, so that they become familiar with LEED standards as well as the benefits.

GLA-2 State Promotion of Renewable Energy

2.1. Siting Renewable Energy on State Lands

The state or municipalities could directly promote renewable projects by allowing renewable facilities to be sited directly on government lands. Wind power for instance can provide direct revenues without depleting any of the state's resources.

2.2. Renewable Electricity Purchase

In the event that consumer clean energy purchase options are developed, the state could purchase a certain, and potentially increasing, percentage of its electricity above the existing RPS level from Class I renewable energy sources. Any marginal cost in electricity could be offset by energy efficiency gains made in state facilities.

2.3. Building Heating and Hot Water

The state could establish a policy that requires a certain portion of building energy, whether in state-owned or leased facilities to come from renewable energy sources. This policy may require retrofits to facilities and could include:

2.3.1. Bioheating Oil

2.3.2. Solar Hot Water Heat

2.3.3. Combined heat and power

2.3.4. Ground source heat pumps

GLA-3 Transportation

3.1. Low GHG Procurement Policy

The state could expand its existing efforts to purchase low emission vehicles by establishing a procurement policy to reduce GHG emission rates for its fleet of cars and light trucks, whether owned, leased, or contracted. This policy could be met by vehicles that utilize biofuels, CNG, fuel cells or hybrid technology and could be encouraged for private fleets state-wide.

3.1.1. Low-MPG Mandate

A set of criteria could be established that ensures that any vehicles purchased met a specific fuel economy for their size and purpose.

3.1.1.1. Hybrid Vehicle Mandate

The state could require a certain percentage of the fleet to possess hybrid technology with attention paid to the distinction between hybrid cars with better fuel economy and hybrids with more power.

3.1.2. Right-Sizing Mandate

A set of criteria could be established to make sure the vehicle meets the needs of the task it will perform, can use a low GHG fuel and gets a certain MPG for that class of vehicle that it must be.

3.1.3. Low Carbon Fuel Mandates

The state could establish a policy that requires that all vehicles to be capable of operating on low carbon fuels with attention paid to the lifecycle emissions associated with the fuels required.

3.1.3.1. Biodiesel Mandate

For the existing fleet that operates on diesel fuel, the state could mandate the use of B5 until such time as ASTM standards for B20 are developed.

3.1.3.2. Ethanol Mandate

With consideration for the lifecycle emissions of ethanol, the state could mandate that a certain percentage of the fleet be capable of running on ethanol and establish pumps to provide higher percentage fuel blends (e.g. E85).

3.1.3.3. Compressed Natural Gas Mandate

The state could establish a requirement that a certain number of vehicles for the appropriate applications are able to run on compressed natural gas.

3.2. State Government VMT Reduction Plan

The state is a significant employer and can establish policies and programs that enable the state employees to reduce the amount of time spent on the road.

3.2.1. Commuting

To reduce the emissions associated with the travel to and from work by state employees, the state could institute policies that enable more widespread use of strategies that reduce travel such as telecommuting, the use of flextime and allowing schedules such as 4/10's or 8/9's.

3.2.2. State Business Related Travel

To reduce the emissions associated with state-related travel, the state could institute policies that enable more widespread use of strategies that reduce travel such as teleconferencing capacity.

Adaptation (ADP)

The majority of the potential actions described in this guide focus on addressing the emissions that are correlated with climate change. Consideration could also be given to how the state will prepare for the inevitable changes that the climate will experience in the coming decades; changes that will likely occur regardless of the degree to which the climate change action occurs in NH and around the globe.

ADP-1 Increase Resistance to Extreme Events

1.1. Upgrade and Harden the Built Environment The state may want to consider working with the appropriate local and regional bodies in order to upgrade, repair and replace the existing infrastructure to withstand the anticipated increase in extreme precipitation events and more powerful storms in terms of wind velocity and volume and speed of runoff. Due to the projected growth in some areas of New Hampshire, consideration may need to be given to integrating the necessary repairs and retrofits with any required expansions in capacity.

- Seawalls
- Dams
- Road & Bridges
- Buildings
- Wastewater treatment facilities

1.2. Preserve and Restore the Ecological Environment

Critical ecosystems are capable of mitigating the impact of extreme precipitation events by reducing the rate of water flow through a watershed by increasing or maintaining the rate of infiltration into groundwater systems and the absorption of water into wetland environments. The state may want to consider the expansion of programs and policies that preserve and restore these critical ecological systems and reduce the impact of human activities upon them.

- Riparian Zones
- Wetlands

ADP-2 Health and Wellness

2.1. Prepare for Changes in Infectious Disease Prevalence

Shifts in precipitation and temperature patterns are projected to lead to an expansion in the range of certain infectious diseases and their vectors. The state could initiate programs to identify emerging threats and provide the support necessary to reduce disease prevalence by managing, to the greatest extent possible, the environmental conditions that exacerbate their spread. The state could also create treatment programs could widespread outbreaks occur.

- Identification
- Management
- Treatment

2.2. Maintain Water Supply

Climate change in NH may lead to synergistic effects as seasonal drought becomes more frequent and the NH population grows, a set of conditions that imposes greater demands on the water supply.

Interventions to maintain adequate surface and groundwater supplies may require:

- Conservation (behavior)
- Efficiency (infrastructure)
- Preservation (capacity)

2.3. Secure the Food Supply

Changes in climate in other parts of the world may reduce the agricultural production capacity and increase food costs or decrease availability of staple foods. The state may want to consider expanding and strengthening the local food system to ensure greater security of its food supply. Specific options were described in *AFW-5 Regional, State and Local Food Supply*.

2.4. Prepare for Air Quality Changes

Air quality is affected by air pollutants as well as temperature. As climate patterns shift the causal factors associated with poor air quality days may increase in prevalence. The state could initiate programs to prepare for this shift and therefore manage the air quality as well care for those affected by low air quality days.

2.4.1. Develop Appropriate Interventions for Likely Changes

The state could identify the likely future trends in air quality days and prepare appropriate responses to care for those affected by the changes.

2.4.2. Address Non-Climate Causal Factors

The state could identify the non-climate causal factors (e.g. NO_x, VOCs) and create policies and programs designed to restrict their development and avoid low air quality days to the greatest degree possible.

2.5. Heat-Related Impacts

The shift in climate is projected to include a significant rise in average annual temperature as well days over 90 and 100 degrees. The state could evaluate potential threats that could arise from the shift in the average temperatures and develop appropriate responses.

2.5.1. Prepare for heat illness

Extreme heat days are correlated with a higher morbidity and mortality among certain segments of the population and the state may need to develop the capacity to reduce the impact of these events on public health. The state could develop a variety of responses including:

- Cooling station deployment
- Early Warning Systems
- PSAs to encourage checking on at-risk populations

ADP-3 Economy

3.1. Established Sectors

The impacts of climate change are projected to cause changes in New Hampshire's resource base and therefore its economy. The state could play a role in softening the impact of climate change

3.1.1. Identify Sectors Likely to Experience Losses

The state could provide assistance in identifying those areas of the state economy that are likely to be most affected by climate change so that the affected businesses can identify the obstacles ahead.

3.1.2. Spur Innovation and Growth

The state could create policies and programs intended to spur innovation and growth and enable the established businesses and industries to adapt to the changes in the existing sectors of the economy.

3.2. Emerging Opportunities

However, as some sectors are negatively impacted, the new reality may provide novel opportunities for the economy to grow in response to climate change, whether to mitigate or adapt to it. The state could play a role in spurring innovation and growth.

3.2.1. Identify Sectors with Emerging Opportunities

The state could provide assistance in identifying those areas of the state economy that are likely to be positively affected by climate change so that the existing businesses and entrepreneurs can develop the operations that will capitalize on the emerging opportunities.

3.2.2. Spur Innovation and Growth in Emerging Markets

The state could create policies and programs intended to spur innovation and growth and enable the established businesses and industries to adapt to the expanding opportunities in the economy.